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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,367	07/05/2005	Takashi Tsunoda	01197.0255	8933

22852 7590 03/27/2007  
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EXAMINER
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WITHERSPOON, SIKARL A

ART UNIT	PAPER NUMBER
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1621

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/541,367	TSUNODA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sikarl A. Witherspoon	1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/5/05, 6/27/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the last line of the instant claim, it is unclear what is meant by the phrase, "in a range *excluding* 0.29 and .051". Applicant has not clearly conveyed the specific range that defined the claim limitation.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-7, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1324717, and further in view of Kawajiri et al (EP 0614872).

The instant claims are drawn to a process for producing an alcohol and/or ketone by contacting a corresponding alkene with an oxide catalyst comprising oxides of molybdenum and/or tin, wherein said catalyst is removed from the reactor, regenerated in the presence of an oxygen-containing gas, and then returned to the reactor, such that the amount of carbonaceous substances accumulated on said catalyst is controlled within a range of 0.1 to 10% by mass.

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GB 1324717 teaches a process for preparing ketones from olefins wherein said olefins are converted over a catalyst comprising molybdenum oxide together with a tin oxide, and wherein the catalyst is regenerated in the presence of an oxygen-containing gas (p 1, lines 15 to 56). The catalyst employed in the reference invention circulates between a reaction zone and a regeneration zone in a fluidized state (p 2, lines 33-40), i.e., the catalyst is removed from the reaction zone, regenerated in said regeneration zone, and then returned to the reaction zone. Tables I-III illustrate the oxidation of propylene and butane to acetone and butanone, respectively, using said oxide catalyst. The ratio of the concentration of olefin and oxygen on which a gas mixture comprising olefin and steam is employed, greatly influences selectivity for formation of ketones (p 5, lines 38-44, and figs. 3 and 4).

The differences between GB 1324717 and the instant claims are that the reference does not expressly mention the formation of carbonaceous substances on the catalyst and to what degree said substances should be controlled, and does not expressly mention the ratio of oxide catalyst returned to the reactor to the amount of alkenes fed to the reactor, as recited in the instant claims (claim 6).

However, Kawajiri et al teach the removal of solid organic matters, i.e., carbonaceous substances from an oxidation catalyst and also a method of regenerating an oxidation catalyst, said catalyst comprising molybdenum oxide and another metal oxide, by mixing steam and an oxygen-containing gas in the presence of said catalyst. Said mixing is conducted at temperatures from 260 to 450° C, wherein the molar ratio of oxygen in the mixed gas is at least 3 vol% (p 3, lines 3-47).

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In light of the combined reference teachings, the examiner contends it would have been obvious to a person having ordinary skill in the art that catalyst degeneration in the process of GB 1324717 would have been do, at least in part, to formation of carbonaceous materials on the oxide catalyst. To that end, it would have been obvious to such a person to regenerate the catalyst using an oxygen-containing gas, as taught by both references, and to control the amount of carbonaceous material on the catalyst within a range that allows for optimal oxidative activity for producing the desired alkanone compound. The ratio of oxide catalyst returned to the reactor upon regeneration, to the amount of alkene would have been prima facie obvious, as a person of ordinary skill would have modified said ratio such that a balance between reactant (alkene) and catalyst (oxide) was afforded that allows for optimal conversion of the alkene to the corresponding alkanone product. The presence of isomers of the starting materials and other oxygenates (as per claim 15), while immaterial, would also have been obvious since a person having ordinary skill in the art would recognize that as the alkene is being fed to the reactor in the presence of the oxidic catalyst, other oxygenates other than the desired ketone and/or alcohol would form and be present in the starting material, especially if the process is conducted as a continuous process.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1324717 and EP 0614872 as applied to claims 1-3, 5-7, and 11-15 above, and further in view of Ozaki et al (US 3,636,156).

The instant claims further limit the process of the present invention such that the atom ratio of molybdenum to the sum of tin and molybdenum in the oxide catalyst is in the range of less than or equal to 0 to less than 0.50. Neither GB 1324717 nor EP 0614872 address this limitation; however, Ozaki et al teach a process for the production of ketones from olefins in the presence of an oxide catalyst comprising molybdenum and another metal, such as tin, wherein the proportion of molybdenum oxide to the other metal oxide(s) is adjusted so that the ratio of molybdenum atom to the other metal atoms is 0.005 to 0.5 (col. 1, lines 68-71).

In light of the combined reference teachings, the examiner takes the position that it would have been obvious to a person of ordinary skill in the art to adjust the atomic ratio of molybdenum to the other metal(s) in the oxide catalyst in order to, as suggested by Ozaki et al, achieve an activity of the catalyst that affords desirable conversion of the alkene reactant, and selectivity to the ketone compound.

### ***Claim Objections***

Claim 9 is objected to because of the following informalities: the parenthetical phrase, "excluding 0.29" should be removed and/or rewritten in the body of said claim, or as a dependent claim. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikarl A. Witherspoon whose telephone number is 571-272-0649. The examiner can normally be reached on M-F 8:30-6:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

saw

*Sikarl A. Witherspoon*

SIKARL A. WITHERSPOON  
PRIMARY EXAMINER